STATE OF CALIFORNIA

The Resources Agency

Department of Water Resources

BULLETIN No. 176

LAND USE IN CALIFORNIA

An Index to Surveys
Conducted By
The California Department of Water Resources
1950–1970

DECEMBER 1971

NORMAN B. LIVERMORE, JR.
Secretary for Resources
The Resources Agency

RONALD REAGAN
Governor
State of California

WILLIAM R. GIANELLI
Director
Department of Water Resources

THE PURPOSE OF THIS DOCUMENT IS TO BRING THE WEALTH OF LAND INFORMATION ASSEMBLED BY THE DEPARTMENT OF WATER RESOURCES OVER A 20-YEAR PERIOD TO THE ATTENTION OF PUBLIC AND PRIVATE PLANNING GROUPS. THERE HAS BEEN AN INCREASING AWARENESS OF THE NEED FOR BROAD-AREA, COMPREHENSIVE PLANNING RELATIVE TO A WIDE ARRAY OF SUBJECTS. THESE DATA ARE UNIQUE IN MANY RESPECTS AND CAN BE IMPORTANT INPUTS TO MOST LAND-RELATED PLANNING EFFORTS.

INTRODUCTION

For more than 20 years the Department of Water Resources and it's predecessor agencies have conducted surveys to monitor the development of California's lands in order to determine the changing needs for water management. The resulting data, along with the Department's assembled information on the physical nature of the land resource, is a valuable input into general statewide planning.

Within the next 50 years the population of California may well have doubled. By 2020 perhaps one of every seven Americans may live in the Golden State. The thought of such an increase in the numbers inhabiting our State gives rise to a number of significant questions:

- Where will 40 million persons live?
- What will be the economic development to support this population?
- Which lands will be developed or converted to accommodate this growth?
- What will be the effect on the environment?
- Where must we expect water management problems to develop?
- Should certain areas be set aside to meet recreation needs?
- What potential do we have for improving the social well being of our people through improved use of the land?
- Can we maintain, or, if necessary, increase agricultural production?

Answers to the above questions can best be developed with a firm foundation of knowledge of past growth characteristics. During the last 20 years, population has doubled, resulting in an average annual increase in urban land of more than 50,000 acres. At the same time, total irrigated acreage has increased more than 20 percent, despite urban encroachment. The Department's survey data provide a basis for developing an understanding of the historic interrelationships between growth factors and the consequences of land use conversions.

Although the pressure on land to meet future demands will increase with time, the total amount of land available will remain unchanged. There are many perplexing problems California will face during the closing years of the 20th century. As our numbers continue to increase, we must double our planning efforts to minimize the adverse effects of our growing population.

Land use changes dramatically in California. On the left is a view of the West Covina area in 1940. On the right is the same scene 23 years later, in 1963.

What can California do to effectively plan for the coming expansion? What are the tasks of the planner as he prepares for the expanding need for urban space, for airports, for highways and railways, for recreational areas, for water resources, for natural open space?

Stated simply, he must aid the people in selecting a set of land use policies by defining broad land use categories, identifying areas suitable for various uses, and recognizing areas of potential conflict. An important "tool" is the land use survey, through which he determines the physical and economic foundation upon which the structure of future development must be built.

Need for Land Use and Land Resource Maps

Comprehensive land use planning requires factual information on the nature, location, and extent of the present use of land and the total land resource. Most sources of land related data present information on a statistical basis only. However, integration of pertinent data to facilitate comprehension of actual land characteristics and the impact of uses is often difficult if not impossible, without graphic representation (maps) showing the actual location of the data elements. Knowledge of the physical relationship of one use to another -- e.g., whether one is upstream or downstream, or lower or higher in elevation from the other – often is critical to understanding the real consequences of development.

The surveys conducted by the Department of Water Resources during the past 20 years have provided such maps for water planning activities to date. These same data undoubtedly can meet the information needs for a much broader range of planning activities. Maps (and acreage tabulations) are available for the whole state, depicting a wide array of physical and economic characteristics of the land. The actual nature of these data and how and where they may be obtained is presented in the following pages, with the intent to further the cause of good planning for all purposes statewide and to increase the efficiency of general planning activities through broader utilization of this important study input.

Land use changes at one location provide impetus to development in other locations. This view of the area northeast of Bakersfield shows a small portion of the expansive new citrus plantings in the San Joaquin Valley that have resulted, to a large extent, from the urbanization of former citrus groves, as depicted in the photographs of the West Covina area.

DEPARTMENT SURVEY ACTIVITIES

The Department of Water Resources recognized at an early date that the specific land data required for state water planning were not available. Therefore, in the late 1940's, the Department initiated a survey activity designed to identify the nature, location, and extent of present land use and lands suitable for various kinds of water-using development. Upon completing these surveys for most of the State to the extent of meeting the then current data needs, the Department initiated a continuing survey program to monitor land use changes on a cycle of 5-10 years.

Currently, the Department's planning activities are being modified to give more in-depth consideration to the impact of land development and associated water management on the environment.

It is envisioned that the planning needs will be such that a wider range of information on present use and suitability for potential development must be accumulated and assembled in a usable form. This will include specific items relating to urban areas, agricultural areas, recreation areas, native vegetation, the characteristics of waterways, unique natural features, wildlife areas, land ownership, areas of special land and water management problems, and other categories.

Beginning in fiscal year 1972, the Department plans to determine what specific kinds of information will be required for it's reoriented planning activities. Following a statewide inventory to determine the availability of the desired data, efforts will be directed toward formulating methodologies for data assembly and processing.

The State Office of Planning and Research will be consulted to determine which other state agencies have similar land-resource information needs and what form of data presentation would be most useful to them.

NATURE OF DATA

The Department has conducted two kinds of surveys-*land use* surveys to record the nature and extent of present water-related land development, and *land classification* surveys to determine the location and extent of lands with physical characteristics suited to specific kinds of development. The nature of land characteristics identified is such that the data are useful in determining possible future growth of both irrigated agriculture and urban development.

The kind of information recorded is shown by the land use and land classification legends presented on pages 4 and 6.

Examples of the completed land use and land classification maps are shown on pages 5 and 7, respectively. These are reductions of the original maps, which are U.S. Geological Survey 7-½ minute quadrangle areas and, at a scale of 1:24,000, measure approximately 22" x 27".

The land use surveys are accomplished through interpretation of current aerial photography supplemented with field inspections.

The land classification surveys involve field examination of soil characteristics such as depth, texture, salinity, etc., and land features such as slope, microrelief, physiographic position, etc.

The acreage of each specific category of land use or class has been determined for each county portion of the survey area, for each quadrangle map, and for other area subdivisions such as water agencies, hydrographic areas and similar analysis areas. The results are stored by electronic data processes for ease in data retrieval.

LAND USE LEGEND

AGRICULTURE

Each parcel of agricultural land use is labeled with a notation consisting basically of three symbols. The first of these is a lower case "i" or "n" indicating whether the parcel is irrigated or nonirrigated. This is followed by a capital letter and number which denote the use group and specific use as shown below.

C SUBTROPICAL FRUITS

1 Grapefruit
2 Lemons
3 Oranges
4 Dates
5 Avocados
6 Olives
7 Miscellaneous subtropical fruits

D DECIDUOUS FRUITS AND NUTS

1 Apples
2 Apricots
3 Cherries
5 Peaches and Nectarines
6 Pears
7 Plums
8 Prunes
9 Figs
10 Miscellaneous or mixed deciduous
12 Almonds
13 Walnuts

G GRAIN AND HAY CROPS

1 Barley
2 Wheat
3 Oats
6 Miscellaneous and mixed hay and grain

F FIELD CROPS

1 Cotton
2 Safflower
3 Flax
4 Hops
5 Sugar beets
6 Corn (field or sweet)
7 Grain sorghums
8 Sudan
9 Castor beans
10 Beans (dry)
11 Miscellaneous field

T TRUCK AND BERRY CROPS

1 Artichokes
2 Asparagus
3 Beans (green)
4 Cole crops
6 Carrots
7 Celery
8 Lettuce (all types)
9 Melons, squash, and cucumbers (all kinds)
10 Onions and garlic
11 Peas
12 Potatoes
13 Sweet potatoes
14 Spinach
15 Tomatoes
16 Flowers and nursery
18 Miscellaneous truck
19 Bushberries
20 Strawberries
21 Peppers (all types)

P PASTURE

1 Alfalfa and alfalfa mixtures
2 Clover
3 Mixed pasture
4 Native pasture

V VINEYARDS

R RICE

I IDLE

1 Land cropped within the past three years but not tilled at time of survey
2 New lands being prepared for crop production

S SEMIAGRICULTURAL AND INCIDENTAL TO AGRICULTURE

1 Farmsteads
2 Feed lots (livestock and poultry)
3 Dairies
4 Lawn areas

Special conditions are indicated by the following additional symbols and combinations of symbols.

A ABANDONED ORCHARDS AND VINEYARDS
F FALLOW (tilled but not cropped at time of survey)
S SEED CROPS
Y YOUNG ORCHARDS AND VINEYARDS
X PARTIALLY IRRIGATED CROPS

INTERCROPPING (or interplanting) is indicated as follows: $i\ \frac{D13\text{-}y}{T9}$ = a melon crop planted between rows of young walnut trees

URBAN

UC - URBAN COMMERCIAL

UC 1 Miscellaneous establishments (offices and retailers)
UC 2 Hotels
UC 3 Motels
UC 4 Apartments, barracks (three family units and larger)
UC 5 Institutions (hospitals, prisons, reformatories, asylums, etc., having a reasonably stable 24-resident population)
UC 6 Schools (yards mapped separately if large enough)
UC 7 Municipal auditoriums, theaters, churches, buildings, and stands associated with race tracks, football stadiums, baseball parks, rodeo arenas, etc.
UC 8 Miscellaneous high water use (indicates a high water use not covered above)

UI - URBAN INDUSTRIAL

UI 1 Manufacturing, assembling, and general processing
UI 2 Extractive industries (oil fields, rock quarries, gravel pits, public dumps, rock and gravel processing plants, etc.)
UI 3 Storage and distribution (warehouses, substations, railroad marshalling yards, tank farms, etc.)
UI 6 Saw mills
UI 7 Oil refineries
UI 8 Paper mills
UI 9 Meat packing plants
UI 10 Steel and aluminum mills
UI 11 Fruit and vegetable canneries and general food processing
UI 12 Miscellaneous high water use (indicates a high water use not covered above)

UV - URBAN VACANT

UV 1 Miscellaneous unpoved areas
UV 4 Miscellaneous poved areas

UR - URBAN RESIDENTIAL

One and two family units, including trailer courts

RECREATION

RR RESIDENTIAL
Permanent and summer home tracts within a primarily recreational area. (The estimated number of houses per acre is indicated by a number in the symbol.)

RC COMMERCIAL
Commercial areas within a primarily recreational area (includes motels, resorts, hotels, stores, etc.)

RT CAMP AND TRAILER SITES
Camp and trailer sites in a primarily recreational area

P PARKS

NATIVE

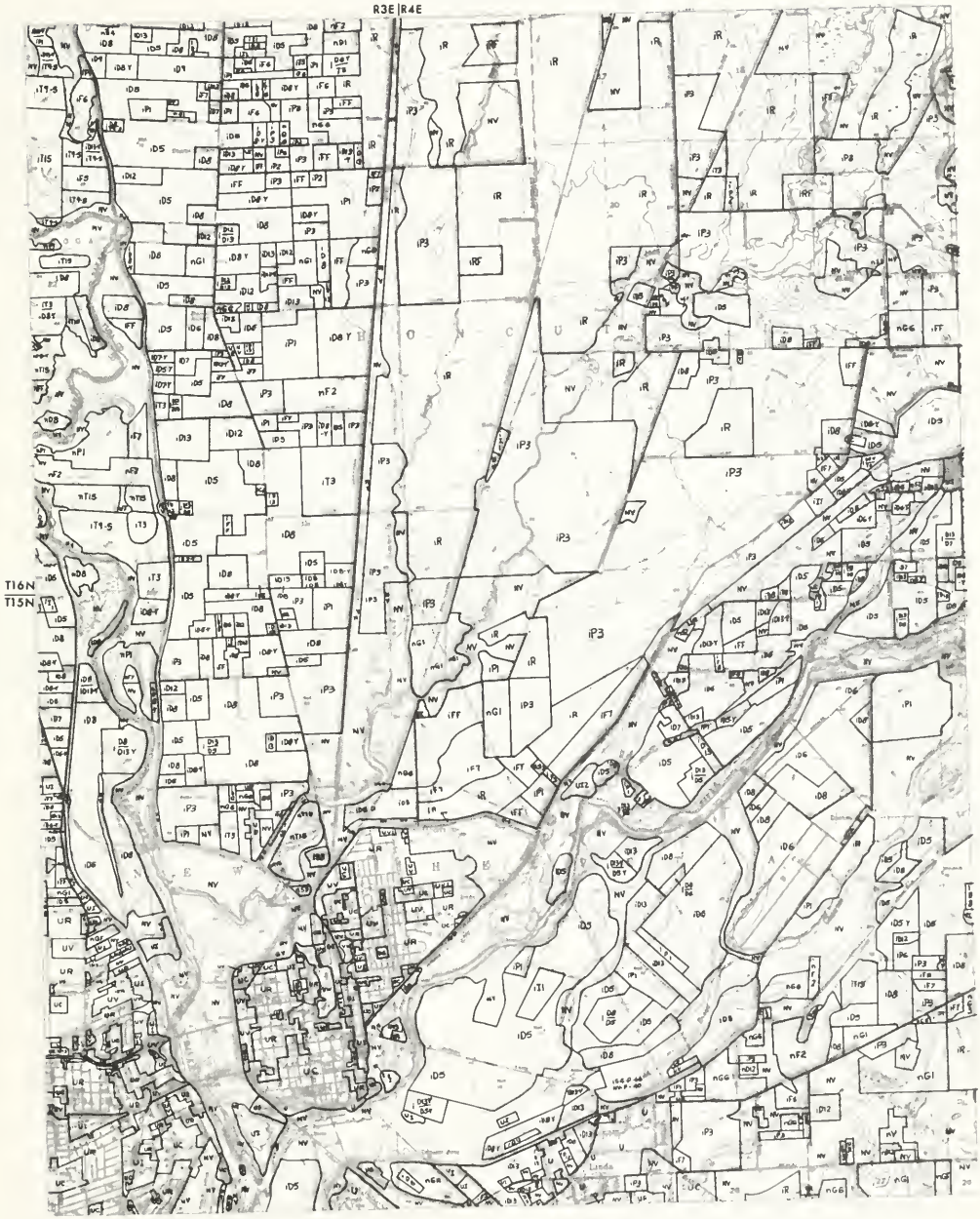
NV NATIVE VEGETATION

NR RIPARIAN VEGETATION
NR 1 Swamps and marshes
NR 2 Meadowland

NW WATER SURFACE

NC NATIVE CLASSES UNSEGREGATED

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES



LAND USE
1961
YUBA CITY QUADRANGLE

LAND CLASSIFICATION LEGEND

URBAN AND RECREATIONAL LANDS

RR Existing and potential permanent and summer home tracts within a primarily recreational area. The estimated number of houses, under conditions of full development, is indicated by a number in the symbol, i.e., RR-3 is suitable for three houses per acre.

RT Existing and potential picnic, camp and trailer sites within a primarily recreational area.

RC Existing and potential commercial areas which occur within a primarily recreational area and which include motels, resorts, hotels, stores, etc.

PP Existing race tracks, fairgrounds, and private, city, county, state, and federal parks.

UD The total area of cities, towns and small communities presently used for residential commercial, recreational, and industrial purposes.

IRRIGABLE LANDS

Irrigable lands are identified by notations which begin with a letter "V", "H", or "M". These symbols indicate the general slope conditions, and may appear along or followed by (other) modifying symbols. The slope conditions indicated by these letters are:

V These lands are level or slightly sloping and vary from smooth to hummocky or gently undulating relief. The maximum slope is 6 percent for smooth, reasonably large bodies lying in the same plane.

H These are lands with greater slope and/or relief than those of the "V" class. They vary from smooth to moderately rolling or undulating relief. The maximum slope is 20 percent for smooth, reasonably large bodies lying in the same plane.

M These are lands with greater slope and/or relief than those of the "H" class. They vary from smooth to steeply rolling or undulating relief. The maximum slope is 30 percent for smooth, reasonably large bodies lying in the same plane.

The description below applies to all "V", "H", and "M" lands on which these slope symbols appear by themselves:

Have soils of medium or deep effective root zones; are permeable throughout; are relatively free of salinity, alkalinity, rock, or other conditions which would limit crop adaptability; are suitable for all climatically adapted crops, being limited only by topographic conditions.

The symbols below, appended to "V", "H", or "M", indicate the described modifying conditions.

S Indicates the presence of an excess of soluble salts or exchangeable sodium in slight amounts.

SS Indicates the presence of an excess of soluble salts or exchangeable sodium in moderate amounts.

SA Indicates the presence of an excess of soluble salts or exchangeable sodium in large amounts.

P Indicates shallow depth of the effective root zone.

W Indicates the presence of a high water table.

L Indicates fairly coarse textures and low moisture-holding capacities.

H Indicates very fine textures.

R Indicates enough rock on the surface or within the plow zone to limit use of the land for cultivated crops.

-B Indicates low-lying basin and seep areas.

-2, -4, -6, or -8 Number indicates, in feet, the average difference between highs and lows due to microrelief.

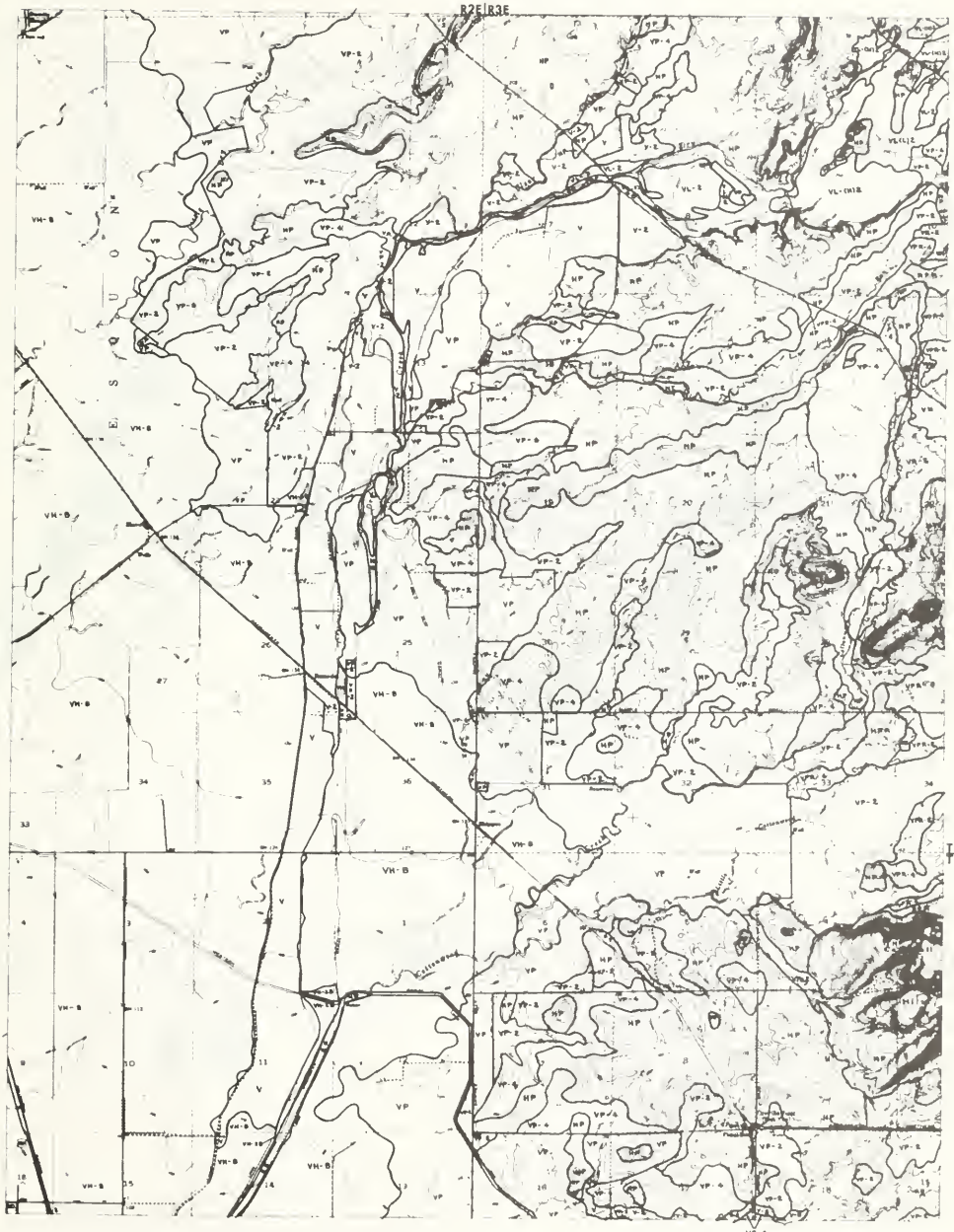
MISCELLANEOUS LANDS

F Presently forested lands, or lands subject to forest management, which meet the requirements for irrigable land but which, because of climatic conditions and physiographic position, are better suited for timber production or some type of forest management program rather than for irrigated agriculture.

VM Swamp and marsh lands which usually support a heavy growth of phreatophytes and are covered by water most of the time.

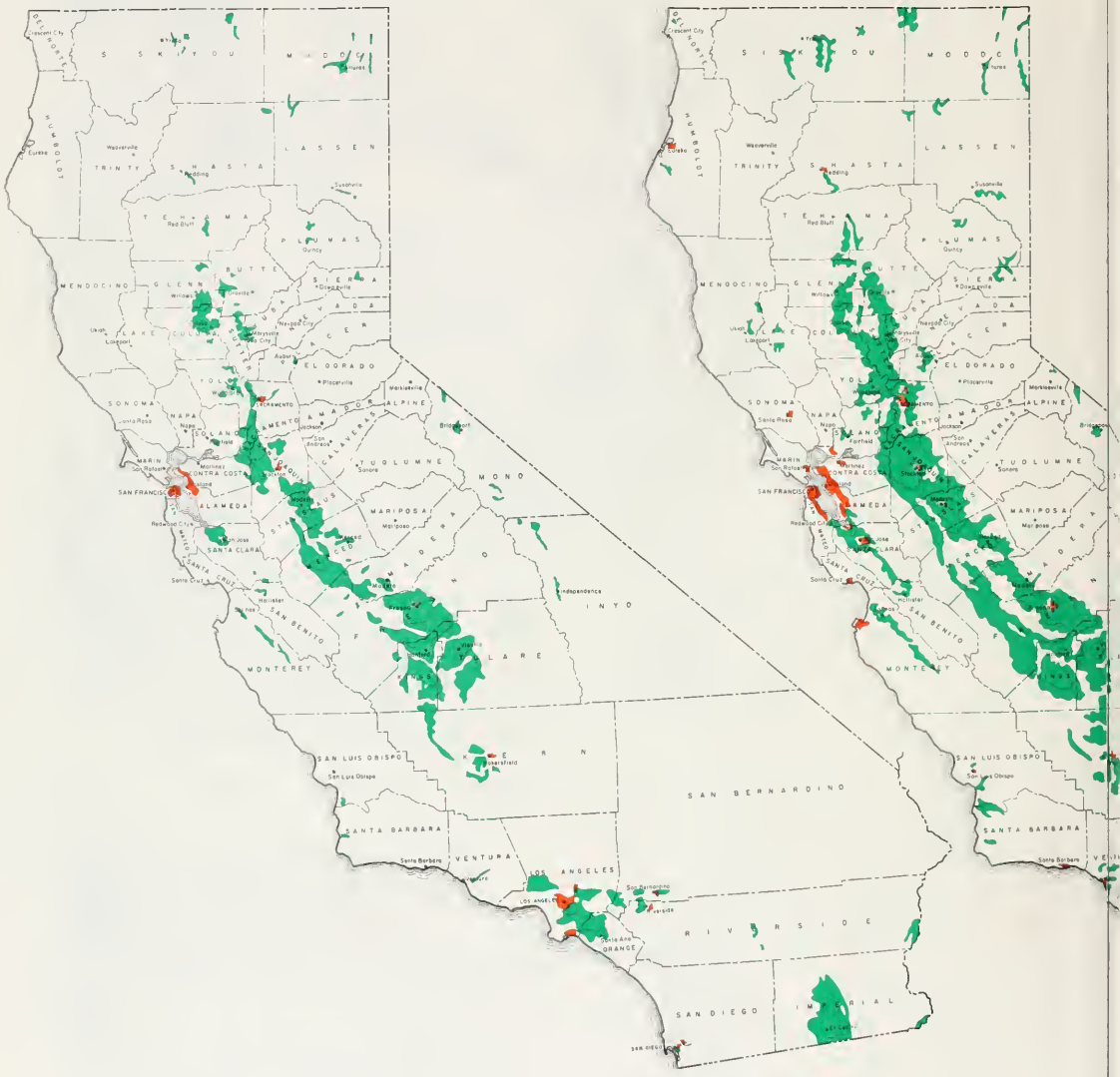
N Includes all lands which fail to meet the requirements of any of the foregoing classes.

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES



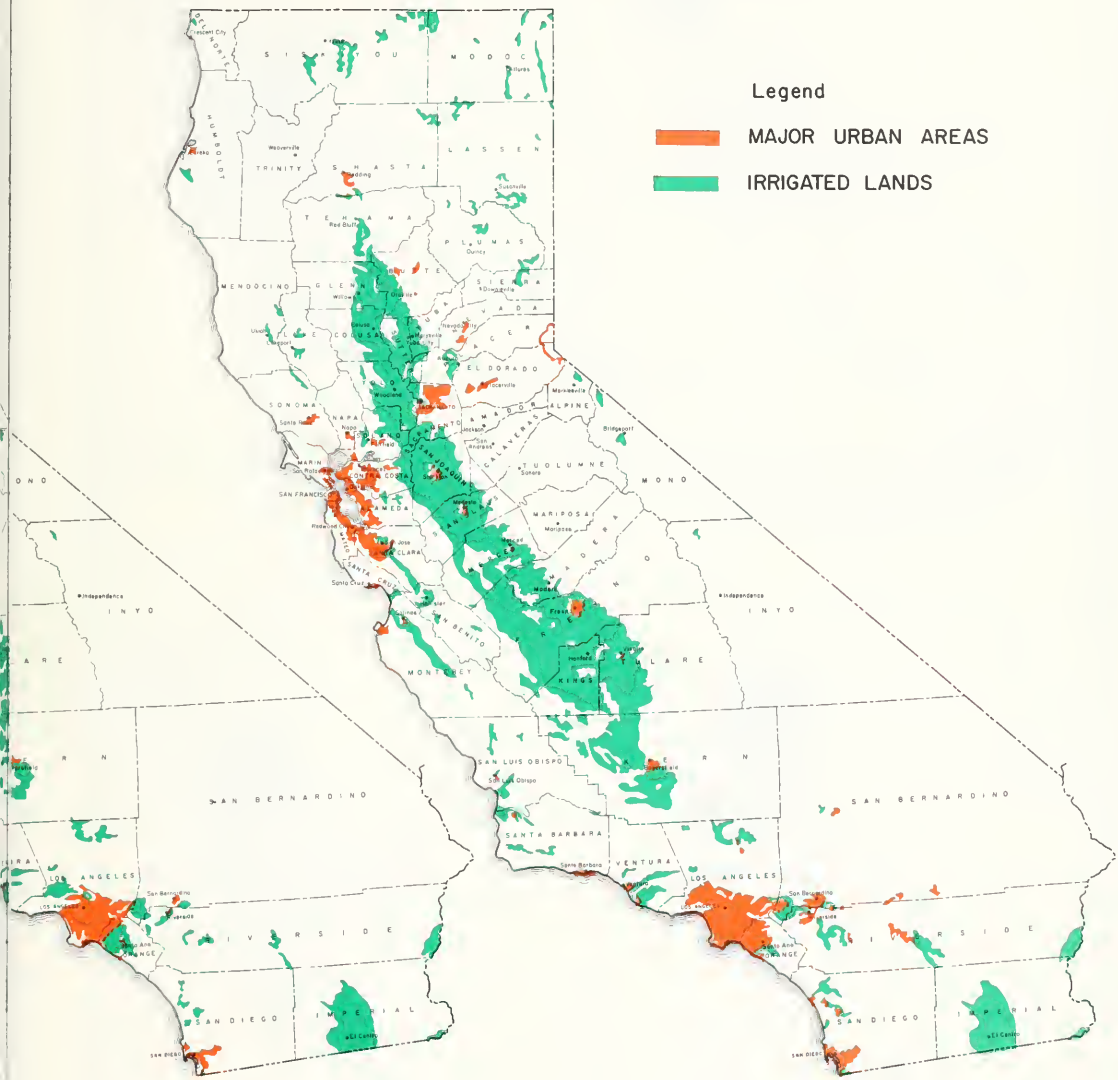
CLASSIFICATION OF LANDS
1962

SHIPPEE QUADRANGLE



1920

Source - U.S.D.A., Bureau of Public Roads



1950

Source - D.W.R. Bulletin No. 2

1970

Source - D.W.R. Bulletin No. 160-70.

AREAS SURVEYED

The figures on the following pages depict the areas covered by land *use* surveys during each of the indicated years and the areal extent of land c*lassification* surveys accomplished through year 1970.

LAND USE SURVEYS
1948-49

LAND USE SURVEYS
1953

LAND USE SURVEYS
1954

LAND USE SURVEYS
1955

LAND USE SURVEYS
1956

LAND USE SURVEYS
1957

LAND USE SURVEYS
1958

LAND USE SURVEYS
1959

LAND USE SURVEYS
1960

LAND USE SURVEYS
1961

LAND USE SURVEYS
1962

LAND USE SURVEYS
1963

LAND USE SURVEYS
1964

LAND USE SURVEYS
1965

LAND USE SURVEYS
1966

LAND USE SURVEYS
1967

LAND USE SURVEYS
1968

LAND USE SURVEYS
1969

LAND USE SURVEYS
1970

LAND CLASSIFICATION SURVEYS

HOW TO OBTAIN THESE DATA

The Department of Water Resources district offices conduct these surveys. Copies of maps and acreage tabulations may be obtained by contacting the office having jurisdiction over the area for which data is desired.

The district boundaries are shown on the map opposite and addresses and phone numbers are given below.

The charge for reproduction is minimal. Billing procedures will be explained by the office contacted.

Northern District

Address: 2440 Main Street
P. O. Box 607
Red Bluff, California 96080

Telephone: (916)527-6530

Central District

Address: 3251 "S" Street
P. O. Box 9137
Sacramento, California 95816

Telephone: (916)445-6831

San Joaquin District

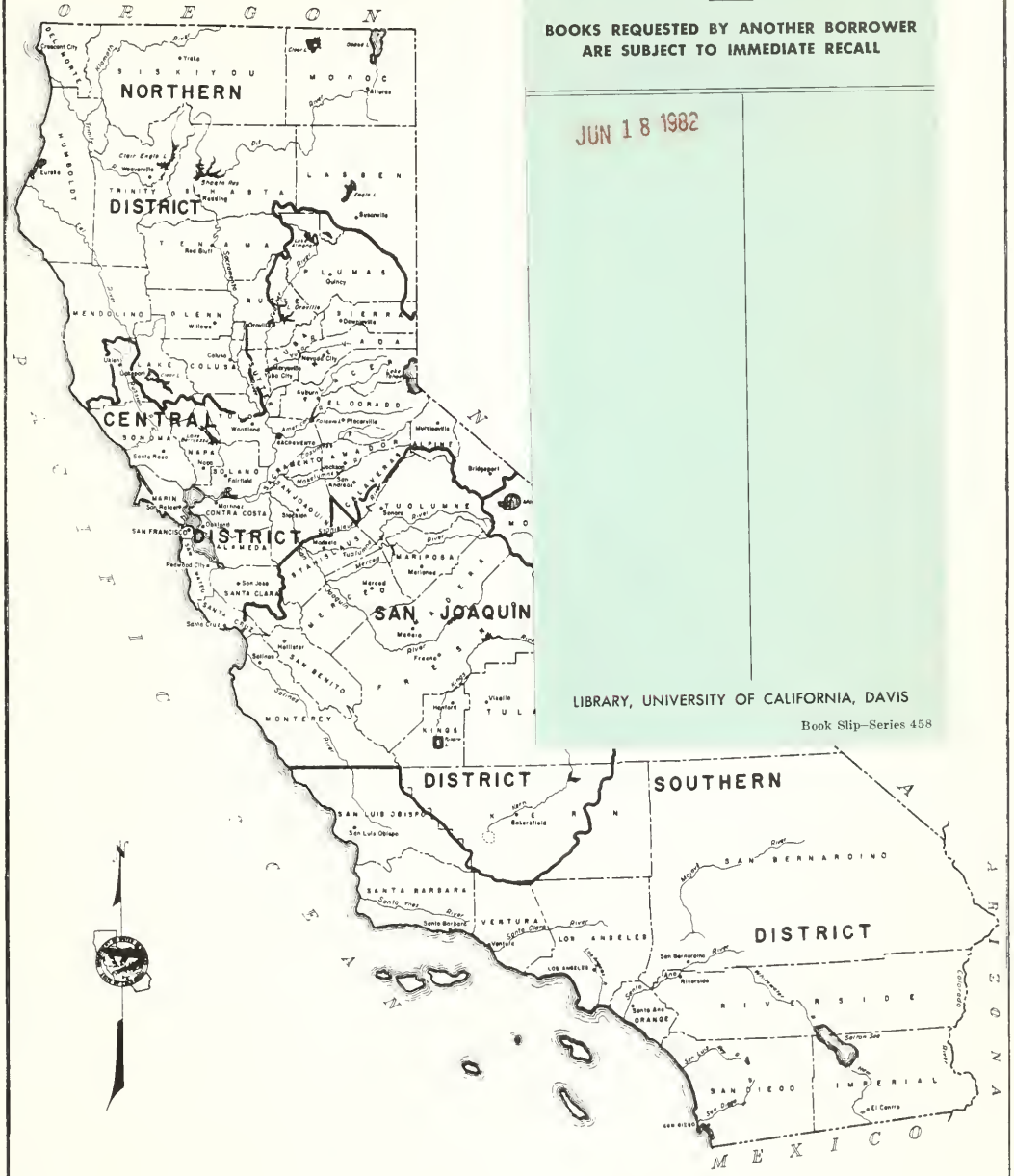
Address: 3374 East Shields Avenue
P. O. Box 2385
Fresno, California 93723

Telephone: (209)488-5443

Southern District

Address: 849 South Broadway
P. O. Box 6598
Los Angeles, California 90055

Telephone: (213)620-4136



HOW TO OBTAIN THESE DATA

The Department of Water Resources district offices conduct these surveys. Copies of maps and acreage tabulations may be obtained by contacting the office having jurisdiction over the area for which data is desired.

The district boundaries are shown on the map opposite and addresses and phone numbers are given below.

The charge for reproduction is minimal. Billing procedures will be explained by the office contacted.

Northern District

Address: 2440 Main Street
P. O. Box 607
Red Bluff, California 96080

Telephone: (916)527-6530

Central District

Address: 3251 "S" Street
P. O. Box 9137
Sacramento, California 95816

Telephone: (916)445-6831

San Joaquin District

Address: 3374 East Shields Avenue
P. O. Box 2385
Fresno, California 93723

Telephone: (209)488-5443

Southern District

Address: 849 South Broadway
P. O. Box 6598
Los Angeles, California 90055

Telephone: (213)620-4136


STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DISTRICT BOUNDARIES
OREGON
NORTHERN
DISTRICT
CENTRAL
DISTRICT
SAN JOAQUIN
DISTRICT
SOUTHERN
DISTRICT
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
SISKIYOU
MODOC
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
HUMBOLDT
MENDOCINO
GLENN
BUTTE
SIERRA
COLUSA
LAKE
NEVADA
PLACER
EL DORADO
SONOMA
NAPA
YOLO
SACRAMENTO
AMADOR
ALPINE
MARIN
CONTRA COSTA
ALAMEDA
SAN FRANCISCO
TUOLUMNE
MONO
STANISLAUS
MARIPOSA
MERCED
SAN MATEO
SANTA CLARA
SAN BENITO
MADERA
FRESNO
INYO
MONTEREY
KINGS
TULARE
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
SAN DIEGO
IMPERIAL